

# Portuguese e-Science Policy and Developments

*4<sup>th</sup> IBERGRID Conference  
Braga, 24-28 May 2010*



*Luis Magalhães*

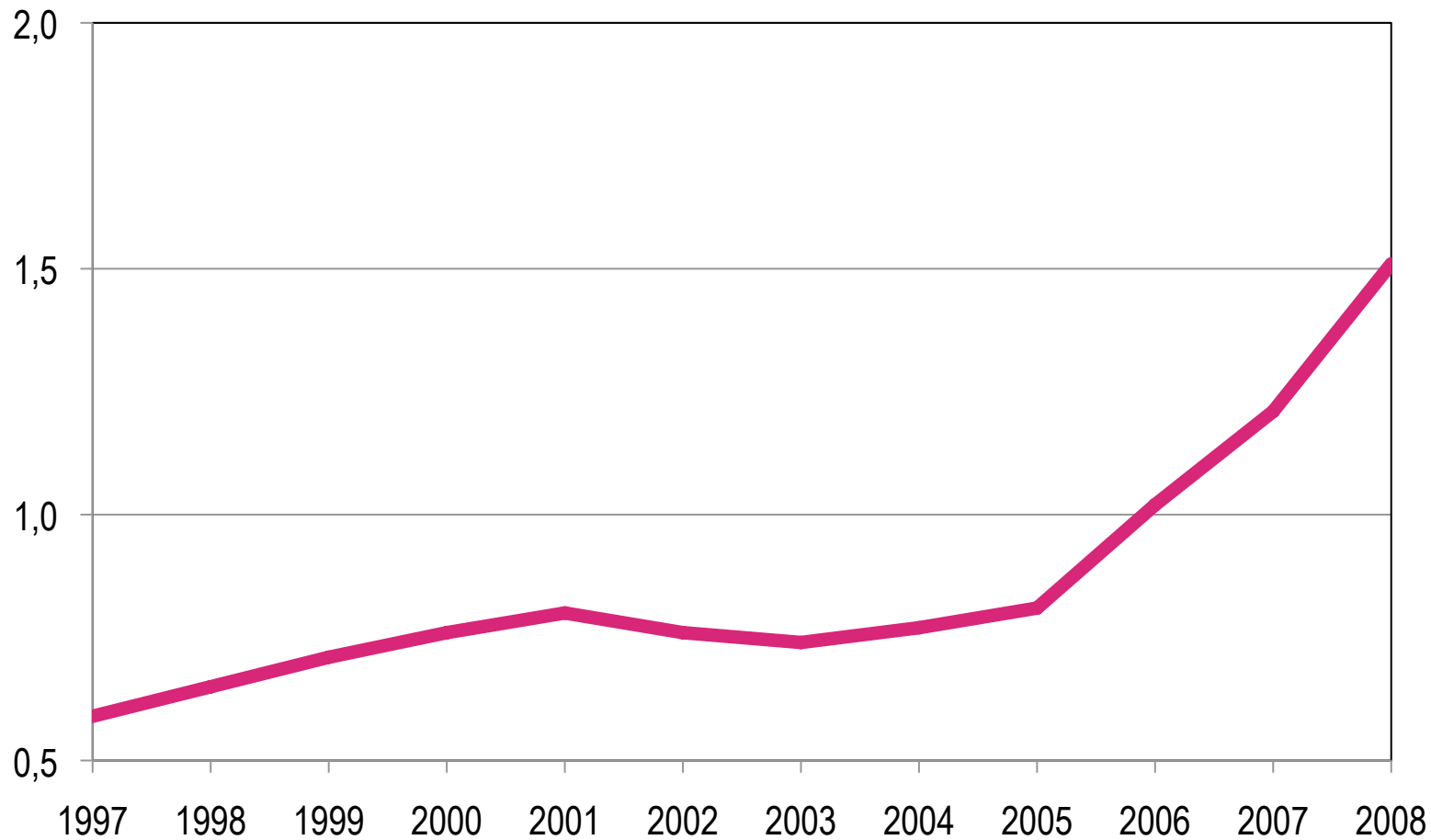
**Knowledge Society Agency**

Ministry of Science, Technology  
and Higher Education, PORTUGAL

# **Context of High S&T Growth in Portugal**

## Investment in R&D

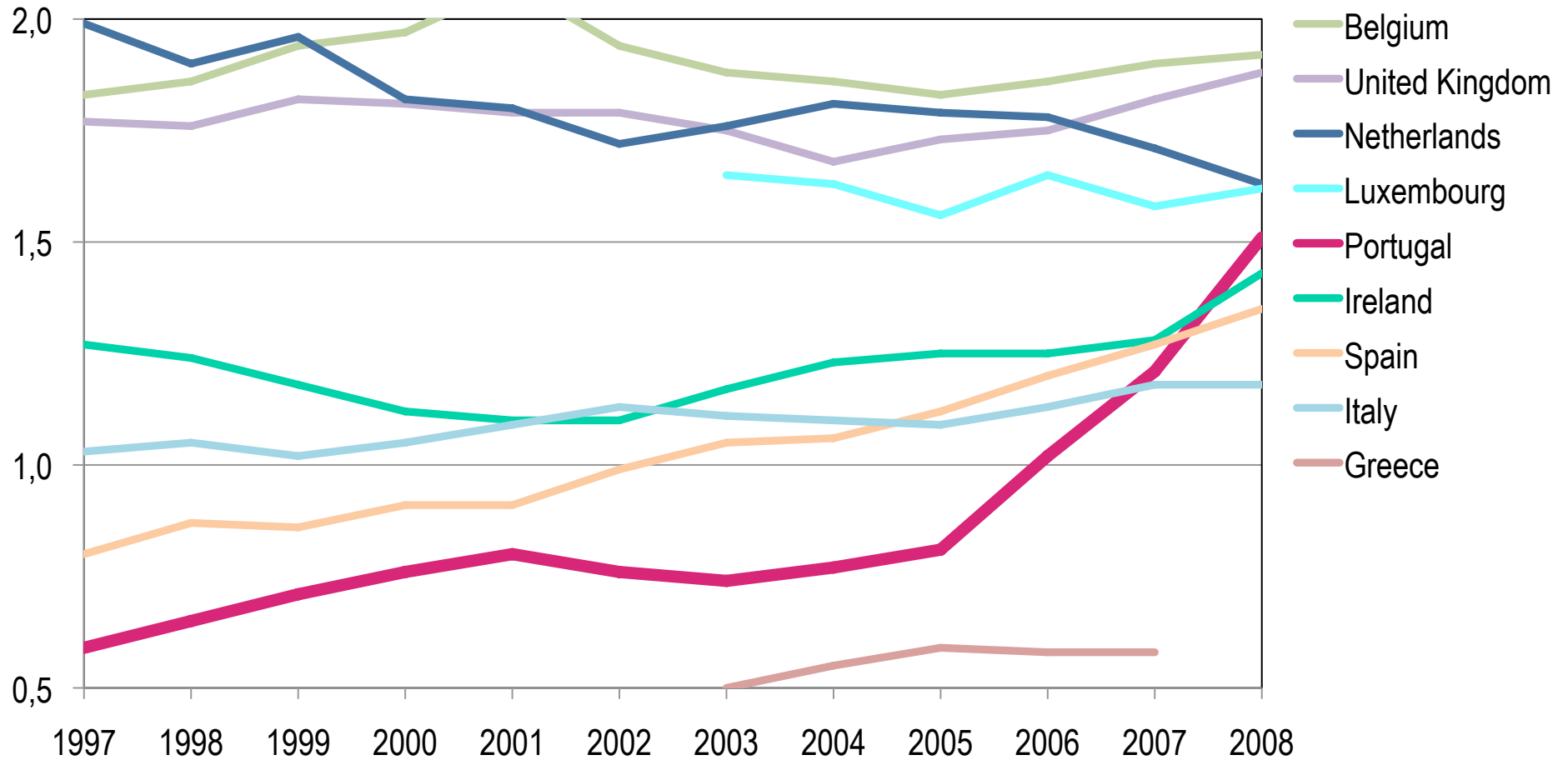
# Evolution of R&D Expense in GNP (%), in Portugal



Source: EUROSTAT

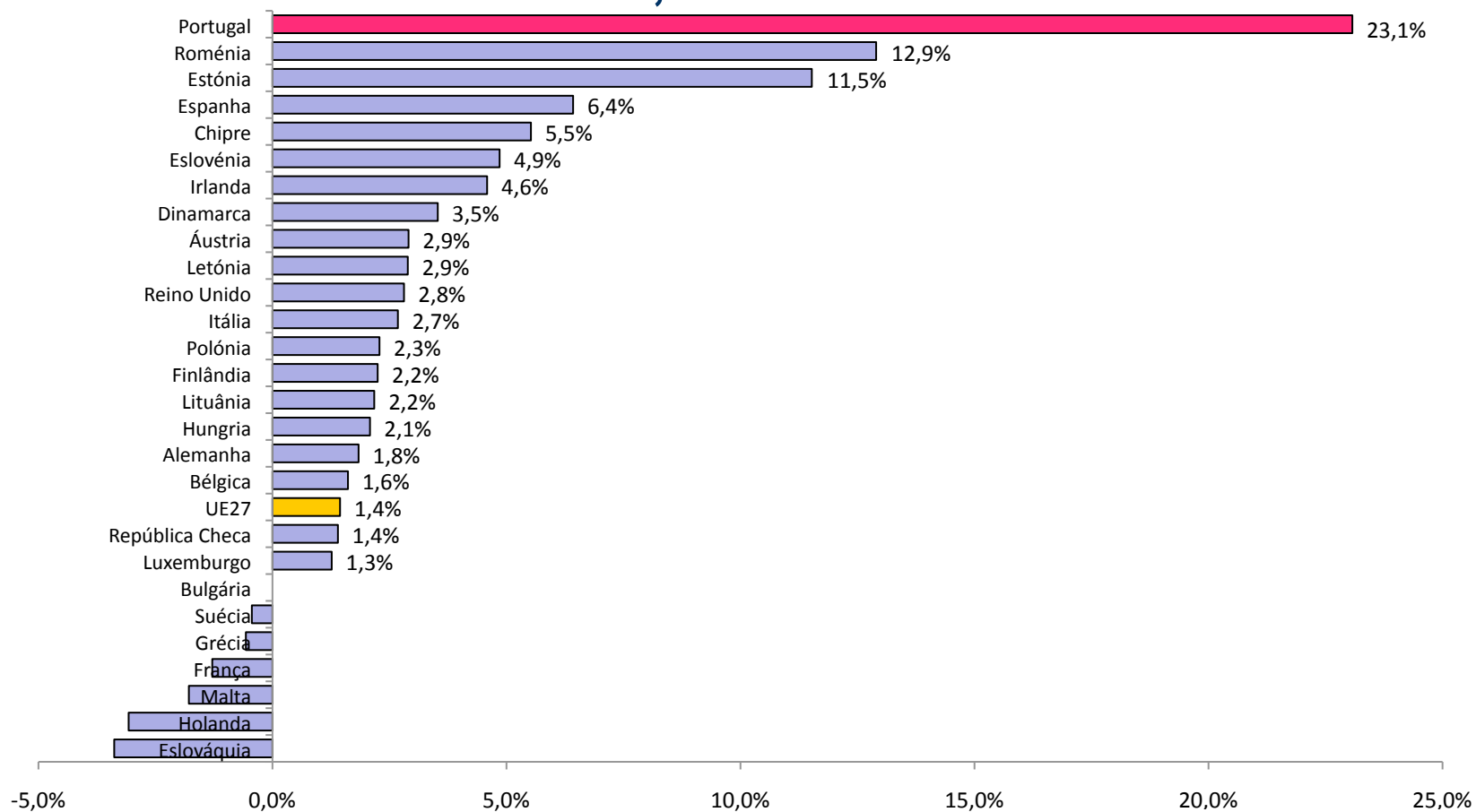
# Evolution of R&D Expense in GNP (%), in Portugal

Highest average growth (23%) of UE27 (total=1,4%) in 2005-2008



Source: EUROSTAT

# Annual Average Growth of % of R&D Expense in GNP, 2005-2008



Source: EUROSTAT



**UMIC**

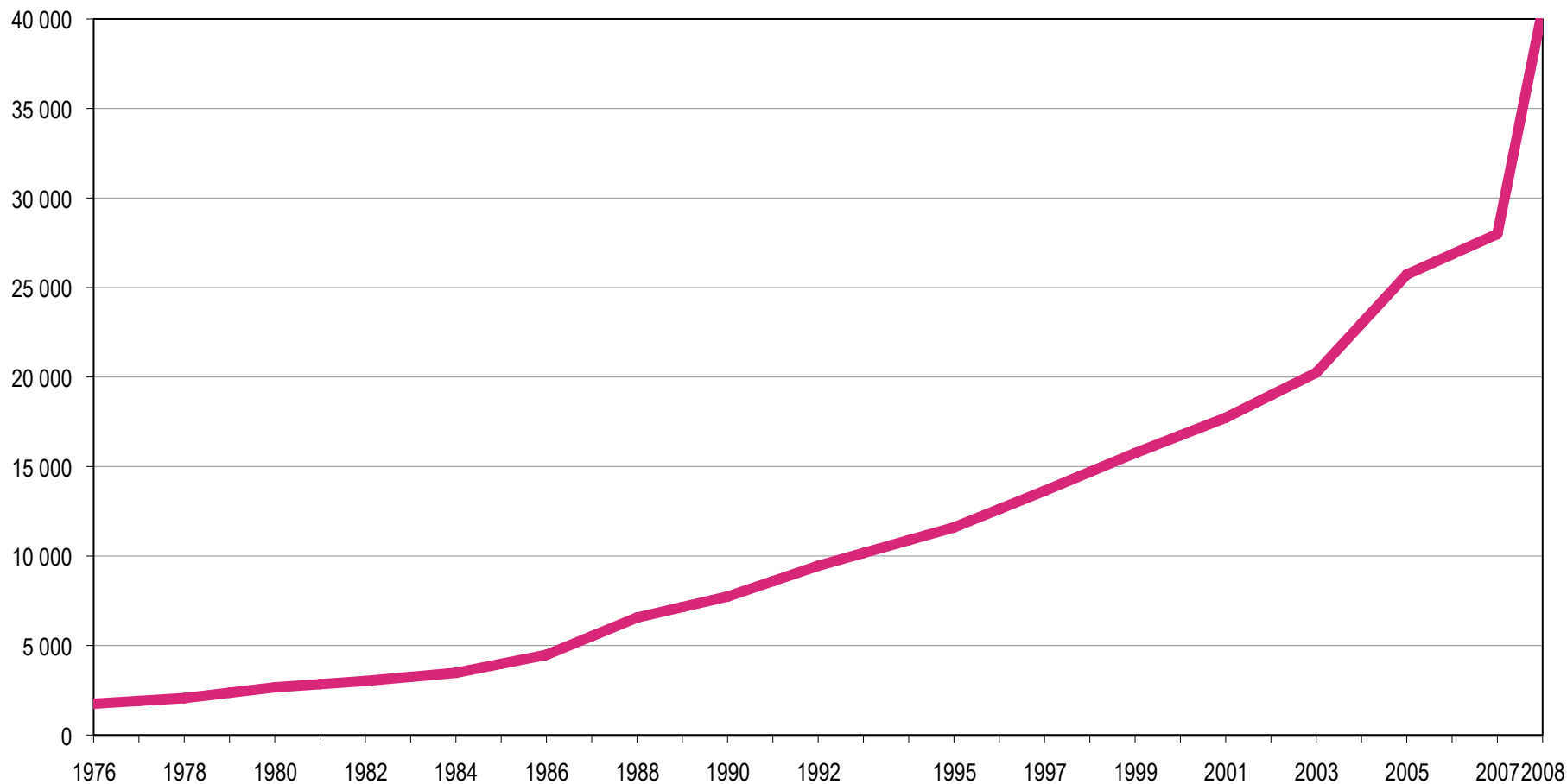
Agência para  
a Sociedade  
do Conhecimento

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

# **Context of High S&T Growth in Portugal**

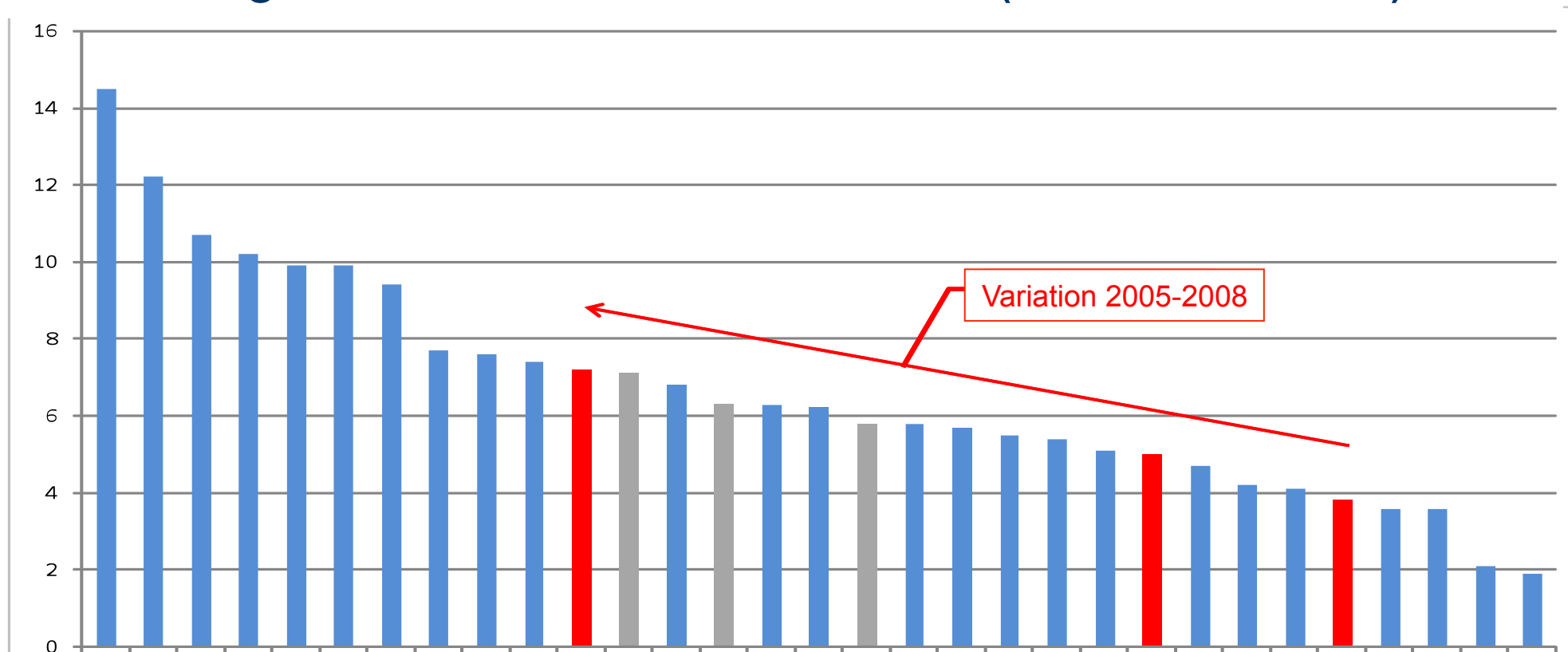
## Investment in People

# High Growth in Researchers (FTE)



Source: EUROSTAT

# High Growth in Researchers (% labor force)



Source: OECD other countries 2007



In this Context of High S&T Growth  
**National e-Science Strategy**

# National e-Science Strategy

## Infraestrutura

- RCTS, National Research and Education Network as an NGN (presently fibre of FCCN to 85% of Higher Education System, at 10 Gbps, scalable)
- e-U Virtual campus with immediate wireless access integrating all Higher Education

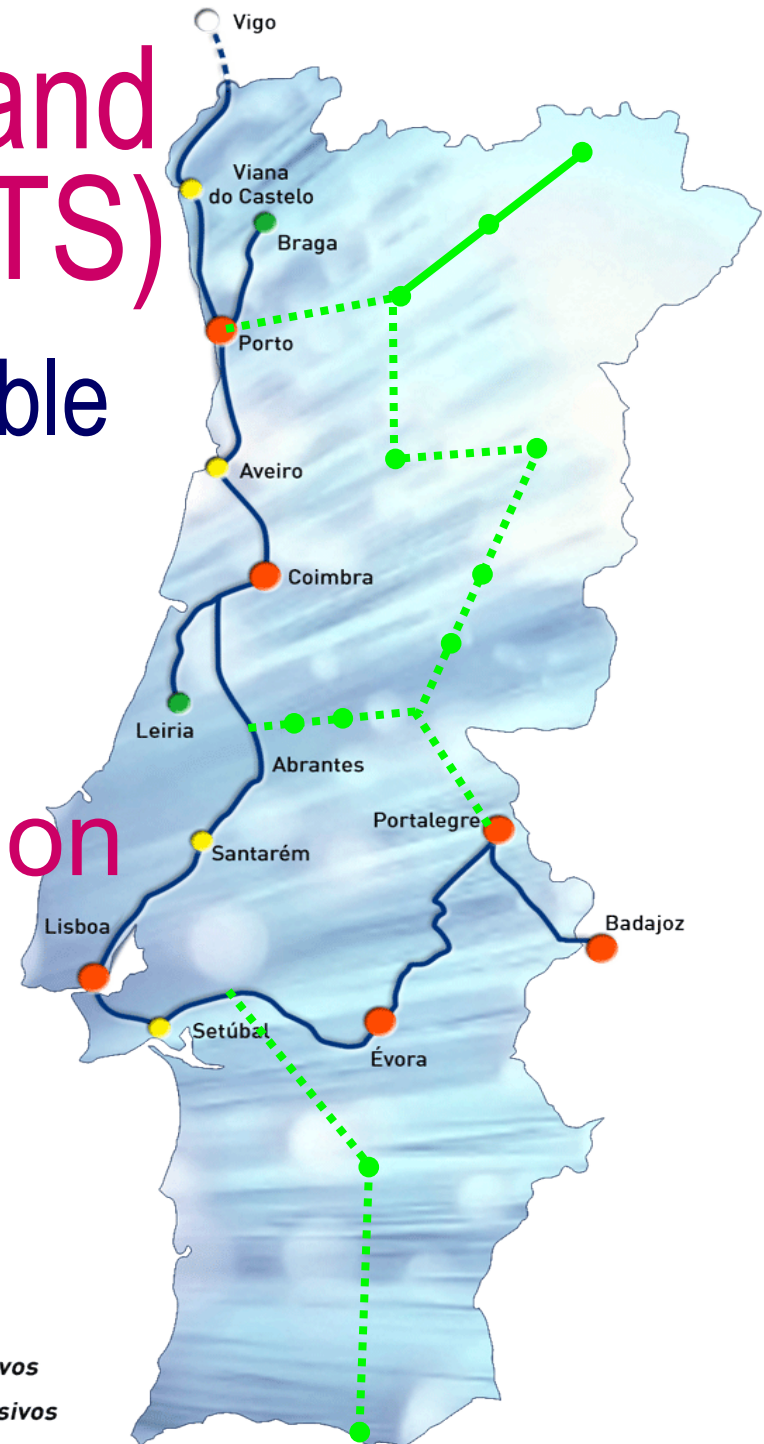
# Science Technology and Society Network (RCTS)

>1,000 Km of optical fiber cable of NREN (2005-2009)

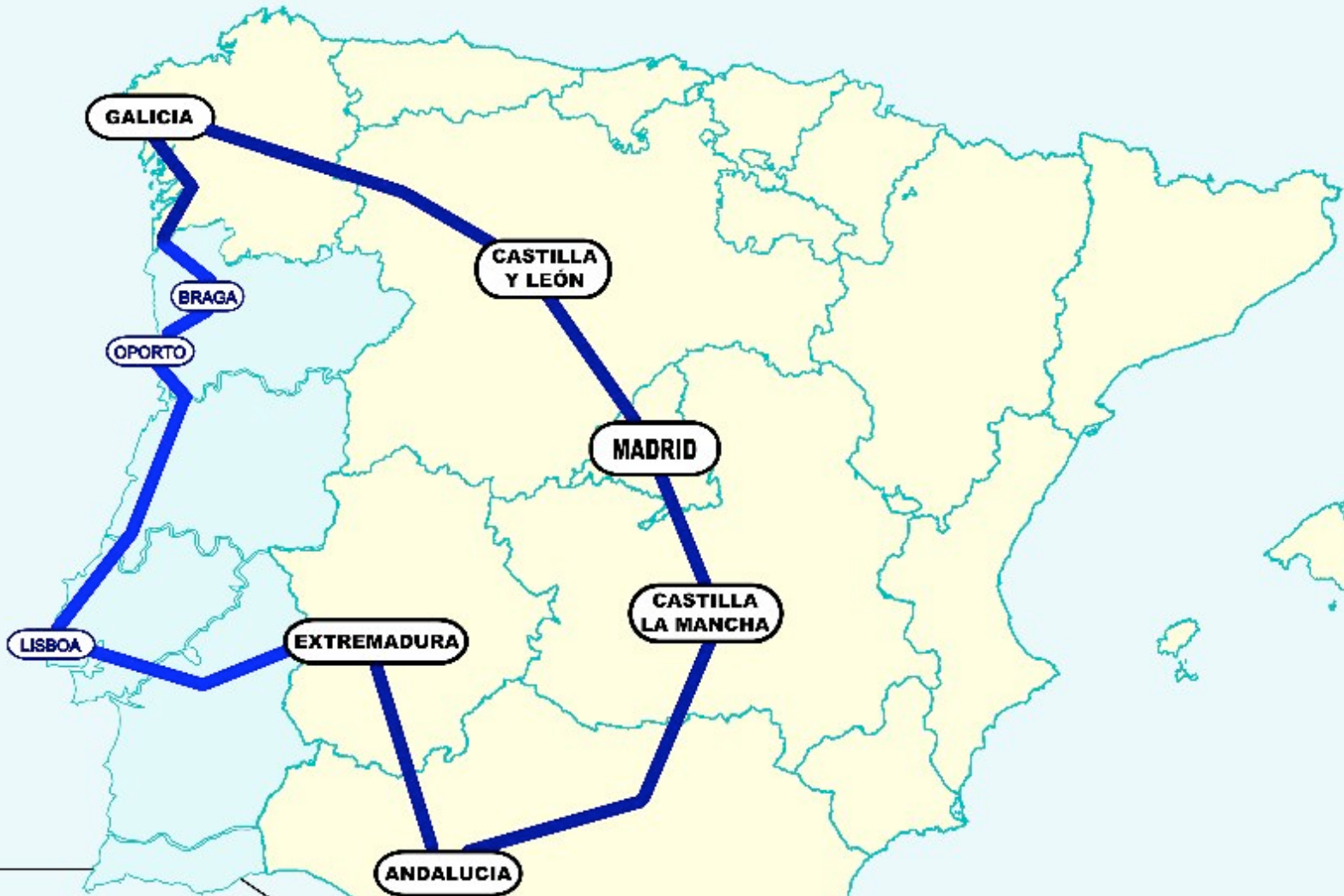
Operation at 10 Gbps

~85% of Higher Education

Planned extension to all District Capitals



Fundação para a Computação Científica Nacional



# Portugal-Spain Dark Fiber Ring

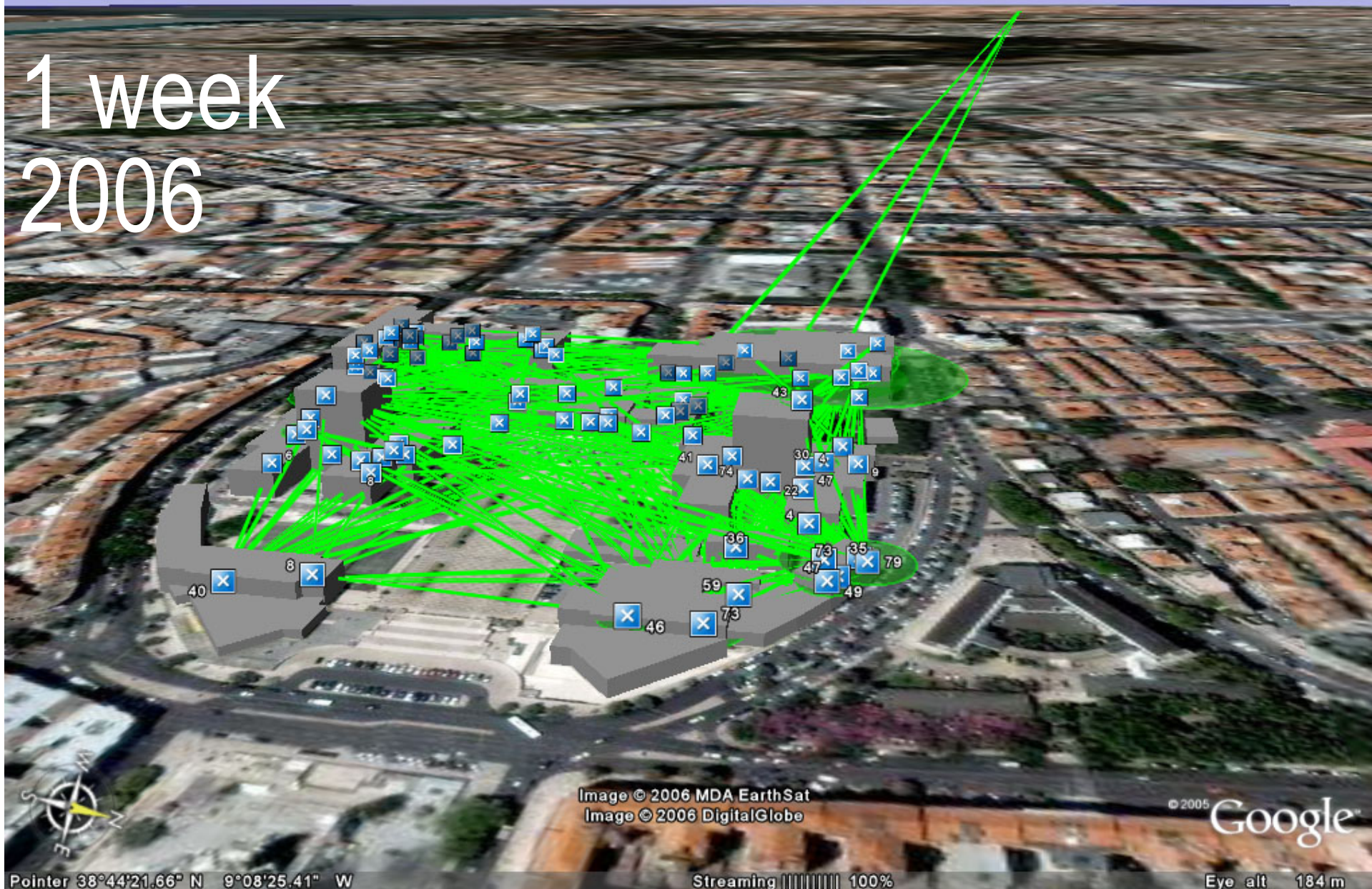




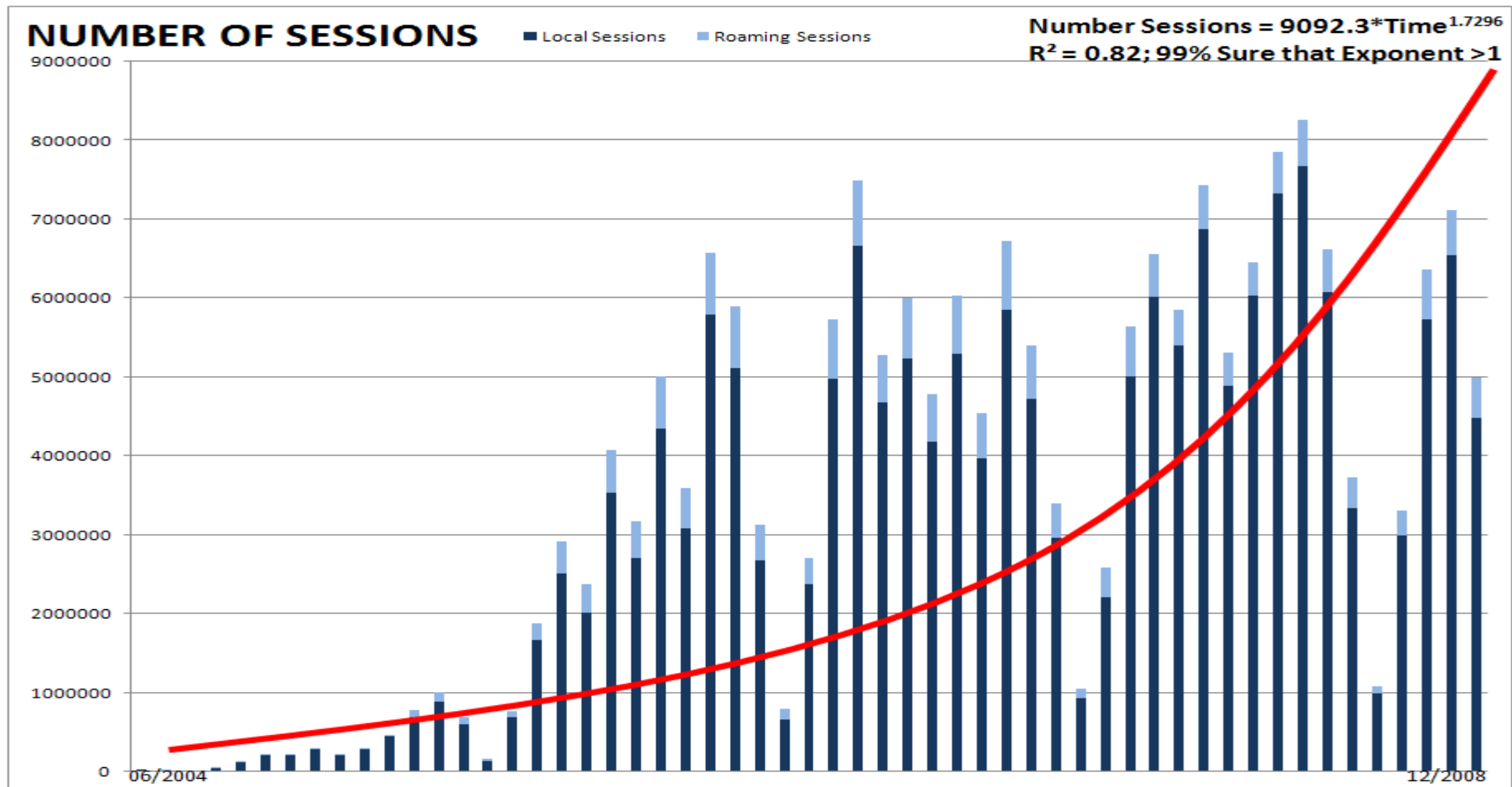
# Roaming between *campi*



1 week  
2006



# Number of Sessions in the e-U Wireless Network



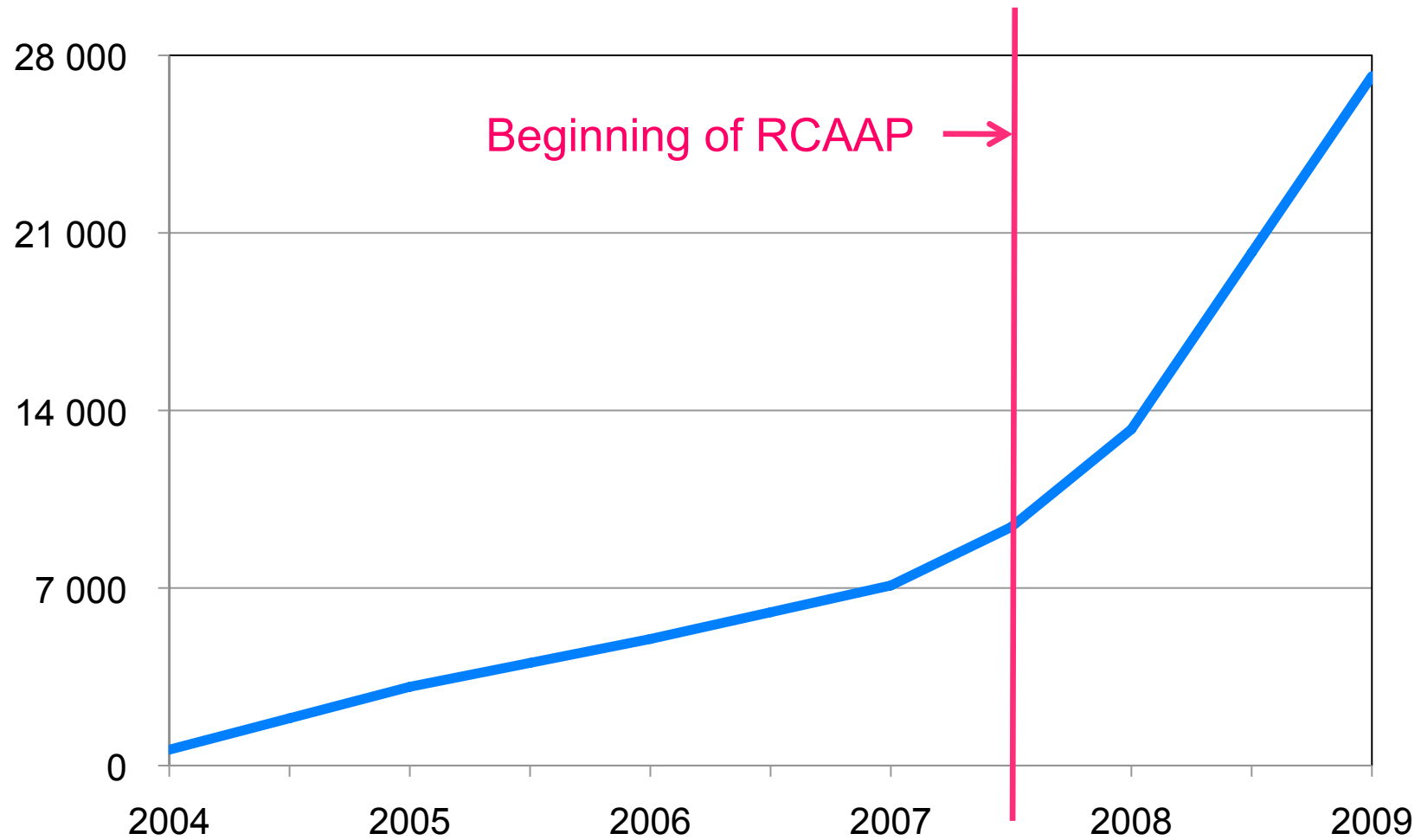
# National e-Science Strategy

## Content

- b-on Knowledge Library Online, planned in 1999, 17,000 scientific journals, free access in all research and higher education institutions, national “big deal”, 6 million full text downloads in 2009
- RCAAP – Open Access Scientific Repository of Portugal presently w/ 26 institutions, including all the 14 public universities, >42,000 documents, protocol w/ Brazil planned to be extended to the whole CPLP
- ZAPPIENS – HD Videos Open Repository w/ Creative Commons licensing and and Digital Rights Management



# N. of Documents in Open Access Scientific Repositories





# National e-Science Strategy

## Distributed Computing

- **INGRID National GRID Initiative** (1.800 CPUs, 1 PetaByte de disc memory, 2 PetaBytes of robot tape memory), integrated w/ Spain (IBERGRID), and part of EGI – European Grid Initiative. Application projects in meteorology, oceanography, evolution of maritime coast, geophysics, seismology, high energy physics, material science, biology, health, forest fires and civil protection)
- **IBERCIVIS – Voluntary Computing for Science**, jointly with Spain

# National e-Science Strategy

## Cooperative Work at a Distance

- HD video-conferencing, webcasting and repository of video recordings of scientific meetings
- VoIP for all public Higher Education, presently in operation, soon to provide tele- and video- conferencing services to be easily operated from each personal computer (Project ARARA)
- National platform for scientific and educational content being developed for Medicina and Future Internet, and to be later extended to other areas, to be available in open access

e-Science as a tool for  
**International Knowledge Networks**

# Examples of International Partnerships

## Building Ambitious International Knowledge Networks

involving research, industry and university

**MIT – Portugal Program** (beginning 11 Oct 2006)

**Engineering Systems:** Sustainable energy and transportation systems • Advanced engineering design and manufacturing in electric car and mobile medical applications

**Carnegie Mellon – Portugal Program** (beginning 27 Oct 2006)

**Future Internet Technologies:** Next Generation Networks and trusted high-quality services • Critical infrastructures security and trust • Cyber-physical systems for ambient intelligence • Human-centric computing • Language technology • Software engineering for large-scale dependable systems

**UTexas Austin – Portugal Program** (beginning 2 Mar 2007)

**Interactive Digital Content, High Performance Computing**

**Fraunhofer – Portugal Program** (beginning May 2008)

**Ambient Assisted Living, Biotechnology, Logistics**

**Harvard Medical School – Portugal Program** (beginning June 2008)

**Medical and Biomedical Research Web Content** for Citizens, Medicine Students and Practitioners